

Spinal Cord Objectives, pg 1 of 3

Describe mechanisms to stabilize the neck and back in an emergent spinal cord injury situation(SCI).

- If pt is in the water, you need to get them out!
- Put pt on a backboard and stabilize neck. If no C-collar around, use towels to support the neck.
- Open the airway by using a jaw-thrust (not the chin lift technique)
- Perform basic ABCs
- Warm them to prevent shock
- If wearing a football helmet, leave it on! Remove the metal face shield to get at the airway
- If wearing a motorcycle helmet, have one person stabilize while the other person removes it.

Discuss how the concepts ischemia and immobility relate to loss of function due to SCI.

- The primary injury will lead to inflammation, which leads to ischemia.
- You need to STOP the inflammation by immobilizing the pt (prevents further injury) and giving them IV anti-inflammatory meds (steroids such as Solu-Medrol)
- Ischemia, when not treated, leads to hypoxia.
- Hypoxia leads to infarct and necrosis. This will cause a loss of function!
- If we can get the inflammation controlled via Solu-Medrol then this can reduce the amount of functional loss
 - 30 mg/kg over 15 mins IV bolus
 - 5.4 mg/kg over 47 hours continuous infusion

Differentiate between cervical, thoracic, lumbar, and sacral SCI in relationship to the loss of motor function.

- C1-4= quadriplegia with total loss of respiratory function; vent dependent
 - (can't breathe no more!)
- C4-C5 = quadriplegia with possible phrenic nerve involvement
 - (did my phrenic nerve die?)
- C5-C6 = quadriplegia with gross arm movements, diaphragmatic breathing
 - (my arms are flailin' and my breathing looks sick)
- C6-C7 = quadriplegia with biceps intact; no hand muscles; diaphragmatic breathing
 - (my biceps are swellin')
- C7 = quadriplegia with bicep and triceps intact; no hand muscles; diaphragmatic breathing
 - (my triceps work too and I'm in heaven)
- T1-T12 = paraplegia with loss of a variety of intercostal and abdominal muscles
 - (i can't move my legs, how 'bout you?)
- L1-L5 = cauda equina injury results in a variety of motor-sensory loss, bowel and bladder dysfunction
 - (i can't keep my poo inside)

Articulate education information to patients and families related to the functional injury of SCI, associated symptoms, and goals for daily functioning.

Level	Muscle function/Sensory Impairment	Functional Goals
C1-C2	no phrenic nerve function; no sensation below neck	respirations managed with phrenic pacemaker
C3-C4	neck control; scapular elevators; diaphragm fxn may be weak or absent	manipulate electric wheelchair with breath control, chin control, or voice activation
C5	fair to good shoulder control; functional deltoids/biceps; elbow flexion; no sensation below clavicles	dress upper trunk; turn self in bed with or without arm slings; propel wheelchair with hand splints or after tenodesis

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Level	Muscle function/Sensory Impairment	Functional Goals
C6	ability to lift shoulders, elbows and wrists (partial); sensation as in C5 but more in arms and thumbs	propel wheelchair with hand-rim projections; self-feeding with hand splints; transfer from wheelchair to bed with or without minimal assistance (a sliding board)
C7	ability to lift shoulders, elbows, wrists, hands (partial); sensation as in C6 level, with more in arms and middle fingers	independent in transfer to bed, car and toilet; total dressing independence; propel wheelchair with standard hand rims; self-feeding with no assistive devices
C8	ability to lift shoulders, elbows, wrists, and hands (partial); sensation as in C7 level, with more in arms and little fingers	independent in transfer to bed, car and toilet; total dressing independence; propel wheelchair with standard hand rims; self-feeding with no assistive devices
T1-T4	ability to use arms and hands normally; no sensation below nipple line; no trunk control	Independent in transfer to bed, car and toilet; total dressing independence; propel wheelchair with standard hand rims; self-feeding with no assistive devices; transfer from wheelchair to floor and return; propel wheelchair up and down curb; transfer from wheelchair to tub and return
T5-L2	partial to good trunk stability; able to use intercostal muscles; no sensation below level of injury	total wheelchair independence; limited ambulation with bilateral long leg braces and crutches (if T2 or below)
L3-L4	All trunk-pelvis stabilizers intact; hip-flexors, adductors, quadriceps	ambulation with short leg braces with or without crutches (depending on level of injury)
L5-S3	Hip extensors, abductors; knee flexors; ankle control; no sensation below midanterior thigh or in perianal area	No equipment needed if plantar flexion is strong enough for push-off at end of stance

Describe symptoms and clinical management for a patient with spinal cord injury for symptoms of spinal shock.

Spinal shock occurs immediately! It is an immediate flaccid paralysis and loss of all sensation and reflex activity below the level of injury.

- S/S = Hypotension, bradycardia, skin below SOI takes on temp of environment
- Treatment
 - give fluids
 - give pressor (dopamine, epinephrine, norepinephrine, phenylephrine/Neo-Synephrine)
 - give Atropine for bradycardia
 - give anti-arrhythmic (maybe)
 - keep pt warm
 - stabilize fracture (obviously)

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Prioritize nursing interventions to treat a patient with symptoms of autonomic dysreflexia.

- S/S of Autonomic Dysreflexia
 - Severe hypertension (can get up to 300 mm Hg)
 - Pounding headache
 - Flushing above the SOI
 - Piloerection (goose flesh)
 - Diaphoresis
 - Dilated pupils, blurred vision
 - Bradycardia
- Interventions
 - Elevate the head of bed to a sitting position IMMEDIATELY
 - Check BP
 - Check for possible sources of irritation (kinked catheter, distended bladder or fecal impaction)
 - Remove the stimulus if it can be done quickly (manifestations should subside)
 - If BP remains elevated, give meds (nitrates, hydralazine, nifedipine)
 - If these actions don't fix the problem, call the doc!
 - *NOTE: When a quadriplegic client complains of a headache, CHECK THE BLOOD PRESSURE!*

Synthesize information on complications common in patients with SCI and develop a nursing care plan with appropriate nursing and collaborative management orders to prevent complications.

- Reduce risk of DVTs: Incidence of DVTs are 47 - 72% and incidence of PE is 37%. Teach about ways to reduce risk
- Reduce spasticity via ROM and possible medication such as baclofen
- Improve bowel and bladder control
 - Spastic or reflex bladder occurs in upper motor neuron disorders
 - Flaccid bladder occurs with lower motor neuron disorders
 - Intermittent catheterization is begun when urine output drops below 600 ml in 4-6 hrs.
 - Pts with injury at C6 or lower can perform self-catheterization if they have adequate hand function
 - Pts with arm function are taught Crede's maneuver to relax sphincter and express urine
 - Bowel training requires sufficient fluid and fiber intake, consistent timing and position.
 - Pt with upper motor neuron damage generally regulate with suppositories and digital stimulation to reduce risk of autonomic dysreflexia.
 - Pt with lower motor neuron neurogenic bowel is more difficult to regulate. This pt often needs manual removal of fecal impaction.
- Prevent pressure ulcers
 - If pt can reposition on their own in bed, they need an "overlay mattress" and an alarm that rings q 2 hrs.
 - A pt with spinal fractures may be placed on a rotating bed (can be disorienting)
- Reduce respiratory dysfunction and risk of aspiration
 - Pt may need help with coughing (quad cough)
- Control pain
- Promote good nutrition and prevent stress ulcers
 - Reglan may increase gastric emptying as a tx for ileus
 - Protonix for stress ulcer prophylaxis

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